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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/610,094	06/30/2000	Glenn David Crabtree	13DV13689	3123

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MCNEES WALLACE & NURICK LLC
100 PINE STREET
P.O. BOX 1166
HARRISBURG, PA 17108-1166

EXAMINER

STEVENS, THOMAS H

ART UNIT	PAPER NUMBER
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2123

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/610,094	CRABTREE ET AL.	
	Examiner	Art Unit	
	Thomas H. Stevens	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-20 were examined.

Response to Applicants Arguments to 2nd Non-Final Action.

Drawings

2. Applicants are thanked for addressing this issue. Examiner understands drawings are to facilitate understanding of an invention; but one has to disclose what pieces or sections of their invention are his/her own works. Clearly, viewing each figure in question, without the specification, are simple geometric figures, thus the reasoning why each should be labeled as prior art.

35 USC § 103

3. Applicants are thanked for addressing this issue. Applicant's state neither D'Angelo or Barka teaches or suggest transformation of finite element model; D'Angelo does state that "We are also investigating the use of a mixed approach where the azimuthally component of the field is expanded using node-based finite elements and the other components..." (pg.540, Conclusions Section, 2nd paragraph). Subsequently, the examiner fails to understand the distinction between "transformation" and "changing" of the scattering matrix with the passing matrix.

The examiner refutes arguments by applicant (pg. 9, last paragraph) regarding the following facts applicants claim was not taught by either D'Angelo or Barka:
Determining portions of an electromagnetic field (D'Angelo: pg. 535, formula 3)
contributed to each independent mode; summing the portion of the electromagnetic field

contribution (D'Angelo: pg. 535, formula 7) by each independent mode of the plurality of independent to calculate a total electromagnetic field for the aircraft component (Barka: pg. 2567, 1st paragraph).

Applicants argue that, for claim 3, Discrete Fourier Transforms (DFT) is not clearly taught or suggested by either D'Angelo or Barka. Equation 7 of D'Angelo is an example of an indefinite Fourier Transform with limits or boundary conditions, thus becoming a discrete Fourier transform (i.e., equation 9 D'Angelo). Furthermore, the applicant's specification states using DFT's by way of finite element models (pg.2, lines 9-20) which D'Angelo's abstract states: "the approach presented finite element method in the frequency domain... truncated using a three-dimensional vector boundary condition". Summarily stated the source teaches an electromagnetic-based discrete Fourier transform towards a specified application.

Applicants argue examiner's motivation to combine is improper. The Barka reference discloses but doesn't expound the teaching of modeling a jet inlet component by way of a radar cross section in the 3-D (Barka: pg. 2556 lines 13-15) whereas D'Angelo does for example page 537, section 3 RADAR CROSS SECTION CALCULATION. Furthermore, MPEP 2143.01, states that one of the possible sources of motivation, is the teaching of the prior art. Combining or modifying the teachings of the prior art to produce the claimed invention can only establish obviousness. Applicant arguments are not persuasive enough to negate rejection; rejection stands.

Final Rejection (3rd Office Action)

Drawings

4. Clearly, viewing figures 1-3 in question, without the specification, are simple geometric figures, thus the reasoning why each should be labeled as prior art.

Claim Rejections - 35 USC § 103

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-20 are rejected under 35 U.S.C. 103 (a) as unpatentable by Barka et al., ("An Efficient Algorithm for the RCS Modulation Prediction from Jet Inlet Engines"

(1999)) in view of D' Angelo et al., ("A New Finite Element Formation for RF Scattering by Complex Bodies of Revolution" (1993)).

Barka et al. teaches using electromagnetic scattering from the interior of a complex jet engine inlet to contribute to the overall radar cross section (RCS) of a modern jet aircraft; but does not teach specific axi-symmetric aircraft related devices. D' Angelo et al. teaches solving electromagnetic scattering from complex inhomogeneous axi-symmetric bodies using finite element analysis.

At the time the invention, it would have been obvious to one of ordinary skill in the art to use Barka et al. to modify D' Angelo et al. since it would be advantageous to capture the RCS from another dimension in space for a precise 3-D representation (D'Angelo: pg. 534, right column 2nd paragraph, lines 1-15 with equations 1,2).

Claim 1. A method of calculating a radar cross section of an aircraft component having an axi-periodic structure comprising the steps of (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract): creating a finite element model for the aircraft component describing electromagnetic characteristics of the aircraft component (Barka: pg. 2566, Introduction); transforming the finite element model into a plurality of independent modes (Barka: pg. 2567, lines 11-12); determining, for each independent mode of the plurality of independent mode (Barka: pg. 2566, lines 19-22); a portion of an electromagnetic field contributed by each independent mode (Barka: pg. 2567, lines 11-12); summing the portion of the electromagnetic field contributed by each independent mode of the plurality of independent modes to calculate a total electromagnetic field for

the aircraft component (D'Angelo: pg. 538, equation 21); and determining the radar cross section for the aircraft component from the total electromagnetic field (Barka: Introduction; D'Angelo: section III, Radar Cross Section Calculation, pg.537-539).

Claim 2. The method of claim 1 (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract) wherein said step of creating a finite element model for the aircraft component further comprises the step of creating a finite element model of a preselected period of the axi-periodic structure of the aircraft component (Barka: Introduction and D'Angelo: pg. 536, figure 1a and 2a and 539-540, right column, lines 5-15 and left column, lines 1-8, respectively).

Claim 3. The method of claim 2 (Barka: Introduction; and D'Angelo: pg. 536, figure 1a and 2a and 539-540, right column, lines 5-15 and left column, lines 1-8, respectively) and wherein said step of transforming the finite element model into a plurality of independent modes further comprises the additional steps of: assembling a system matrix for the finite element model of the preselected period of the axi-periodic structure of the aircraft component; and applying a Discrete Fourier Transform to the system matrix (D'Angelo: pg.537, equation 20).

Claim 4. The method of claim 1 (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract) wherein said step of creating a finite element model for the aircraft component

further comprises the step of creating the finite element model using second order edge elements (D'Angelo: pg. 535, equation 13).

Claim 5. The method of claim 4 (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract) wherein the second order edge elements (D'Angelo: pg. 536, left column, lines 6-8) are curl conforming type elements (D'Angelo: pg. 535, equation 13).

Claim 6. The method of claim 1 (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract) wherein said step of determining, for each independent mode of the plurality of independent modes, a portion of an electromagnetic field contributed by each independent mode further comprises the additional steps of creating a mathematical representation of a reference pipe having an infinite length (D'Angelo: pg.540, lines 8-31); and using the mathematical representation of the reference pipe to determine the portion of the electromagnetic field contributed by each independent mode (D'Angelo: pg. 539-540, Results and Discussion).

Claim 7. The method of claim 6 (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract) wherein said step of determining, for each independent mode of the plurality of independent modes, a portion of an electromagnetic field contributed by each independent mode further comprises the additional steps of creating a mathematical representation (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract) of a test fixture; creating a mathematical representation of the aircraft component in a cavity

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(Barka: pg. 2566, lines 17-19); coupling the mathematical representation of the test fixture to the mathematical representation of the aircraft component to create a mathematical representation of a combination of the test fixture and the aircraft component (Barka: pg. 2568, figure 1 with pg.2566, lines 1-8 and 23); coupling the mathematical representation of the reference pipe (Barka: pg. 2567, lines 1-3) to the mathematical representation of the combination of the test fixture and the aircraft component to create a mathematical representation of the reference pipe (Barka: pg. 2567, lines 1-3), the test fixture and the aircraft component having a common interface between the test fixture and the reference pipe (Barka: pg. 2567, lines 1-3); and solving the mathematical representation of the reference pipe, the test fixture and the aircraft component by introducing a mathematical representation of an incident wave at the common interface of the test fixture and the reference pipe (Barka: pg. 2568, figure 1 with pg.2566, lines 1-8 and 23).

Claim 8. The method of claim 7 (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract) wherein said step of creating a mathematical representation of a test fixture further comprises the additional steps of creating a single layer of finite elements describing electromagnetic characteristics of the test fixture (Barka: pg. 2566, lines 18-22); assembling a system matrix for the single layer of finite elements (Barka: pg. 2566, lines 18-24); factoring the system matrix for the single layer of finite elements into a test fixture impedance matrix, wherein the test fixture impedance matrix represents end

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surfaces of the test fixture having a length; and doubling the length of the test fixture represented by the test fixture impedance matrix until a preselected length of test fixture is represented by the test fixture impedance matrix (Barka: pg. 2566, lines 18-24).

Claim 9. The method of claim 8 (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract) wherein said step of creating a mathematical representation of a reference pipe having an infinite length further comprises the additional steps of (Barka: pg. 2567, lines 1-3 and D'Angelo: pg. 540, lines 14-31): copying the test fixture impedance matrix representing the test fixture of the preselected length to create a reference pipe impedance matrix, wherein the reference pipe impedance matrix represents end surfaces of the reference pipe having the preselected length; and doubling the length of the reference pipe represented by the reference pipe impedance matrix until a length of reference pipe is represented wherein the end surfaces of the reference pipe are uncoupled (Barka: pg. 2567, lines 1-3 and D'Angelo: pg. 540, lines 14-31).

Claim 10. The method of claim 7 (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract) wherein the mathematical representation of the test fixture, the mathematical representation of the reference a pipe and the mathematical representation of the aircraft component, are each a super-element and the method further comprises the steps of storing the super-elements for the test fixture (Barka: pg. 2567, lines 1-3 and D'Angelo: pg. 540, lines 14-31), reference pipe and aircraft component in memory; modifying the aircraft component (Barka: pg. 2567, lines 1-13); and reusing stored

super-elements for the test fixture and reference pipe to calculate a radar cross section for the modified aircraft component (Barka: pg. 2567, lines 5-11).

Claim 11. The method of claim 7 (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg. 534, abstract) wherein said step of determining, for each independent mode of the plurality of independent modes, a portion of an electromagnetic field contributed by each independent mode further comprises the additional steps of coupling the mathematical representation of the reference pipe to another identical mathematical representation of the reference pipe to create a mathematical representation of a two-sided reference pipe having a common interface (Barka: pg. 2567, lines 1-3 and D'Angelo: pg. 540, lines 14-31); solving the mathematical representation of the two-sided reference pipe by introducing the incident wave at the common interface of the two reference pipes (D'Angelo: pg. 540, lines 14-31); and determining the difference between the solution of the representation of the reference pipe, test fixture and aircraft component and the solution of the representation of the two-sided reference pipe (Barka: pg. 2567, lines 11-13).

Claim 12. The method of claim 1 (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg. 534, abstract) wherein the plurality of independent modes comprises primary modes and conjugate modes related to the primary modes and said step of determining, for each independent mode of the plurality of independent modes, the portion of an electromagnetic field contributed by each independent mode further comprises the

additional steps of determining an impedance matrix (Barka: pg. 2567, lines 26-34) for each primary mode of the plurality independent modes; and determining an impedance matrix (D'Angelo: pg. 539, right column lines 5-15 with pg. 540, lines 1-8) for each conjugate mode by transposing the impedance matrix of the corresponding primary mode for each conjugate mode.

Claim 13. A computer program (Barka: pg. 2567, lines 5-12) product embodied on a computer readable medium and executable by a computer for calculating the radar cross section (RCS) of an aircraft engine face component, the computer program product comprising computer instructions for executing the steps of creating a finite element model for the aircraft engine face component describing electromagnetic characteristics of the aircraft engine face component (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract); transforming the finite element model into a plurality of independent modes(Barka: pg. 2567, lines 5-12); determining, for each independent mode of the plurality of independent modes, a portion of an electromagnetic field contributed by each independent mode (Barka: pg. 2567, lines 18-34); summing the portion of the electromagnetic field contributed by each independent mode of the plurality of independent modes to calculate a total electromagnetic far-field for the aircraft engine face component (D'Angelo: pg. 537, equation 17); and determining the radar cross-section for the aircraft engine face component from the total electromagnetic far-field (D'Angelo: pg.537, equation 18).

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Claim 14. The computer program product of claim 13 (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg. 534, abstract) wherein the step of determining, for each independent mode of the plurality of independent modes, a portion of an electromagnetic field contributed by each independent mode further comprises the additional steps of creating a mathematical representation of a test fixture (Barka: pg. 2566, lines 18-22); creating a mathematical representation of the aircraft engine face component in a cavity (Barka: pg. 2566, Introduction); creating a mathematical representation of a reference pipe having an infinite length; coupling the (Barka: pg. 2567, lines 1-3 and D'Angelo: pg. 540, lines 14-31); mathematical representation of the test fixture to the mathematical representation of the aircraft engine face component to create a mathematical representation of the combination of the test fixture and the aircraft engine face component (D'Angelo: pg. 535, equation 13 and pg. 536, left column, lines 1-4; with Barka: pg. 2566, Introduction); coupling the mathematical representation of the reference pipe to the mathematical representation of the combination of the test fixture and the aircraft engine face component to create a mathematical representation of the reference pipe, the test fixture and the aircraft component having a common interface between the test fixture and the reference pipe (D'Angelo: pg. 535, equation 13 and pg. 536, left column, lines 1-4; with Barka: pg. 2566, Introduction, and pg. 2567, lines 1-3); and solving the mathematical representation of the reference pipe, the test fixture and the aircraft engine face component by introducing a mathematical representation of an incident wave at the common interface of the test fixture and the reference pipe

(D'Angelo: pg. 540, conclusions with pg. 539 figures 7 and 8; with Barka: pg. 2567, lines 18-34).

Claim 15. The computer program product of claim 14 (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract) wherein the step of determining, each independent mode of the plurality of independent modes, a portion of an electromagnetic field contributed by each independent mode further comprises the additional steps of (D'Angelo: pg. 537, equation 20): coupling the mathematical representation of the reference pipe to another identical mathematical representation of the reference pipe to create a mathematical representation of a two-sided reference pipe having a common interface (D'Angelo: pg. 535, equation 13 with pg. 536, left column, lines 1-4; and Barka: pg. 2567, lines 1-3); solving the mathematical representation of the two-sided reference pipe by introducing the incident wave at the common interface of the two reference pipes (D'Angelo: pg. 540, conclusions with pg. 539, figures 7 and 8; with Barka: pg. 2567, lines 18-34); and determining the difference between the solution of the representation of the reference pipe, test fixture and aircraft engine face component and the solution of the representation of the two-sided reference pipe (D'Angelo: pg. 540, conclusions with pg. 539, figures 7 and 8; with Barka: pg. 2567, lines 18-34).

Claim 16. The computer program product of claim 13 (Barka: pg. 2567, lines 5-12 and 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract) wherein the aircraft engine face component has an axi-periodic structure and said step of creating a finite element model for the aircraft engine face component comprises the additional step of creating a

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finite element model of a preselected period of the axi-periodic structure of the aircraft engine face component using second order edge elements (D'Angelo: pg. 536, lines 6-9).

Claim 17. A system for calculating the radar cross section (RCS) of an aircraft engine component comprising (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg. 534, abstract): a computer having memory and a processing unit; means for creating a finite element model for the aircraft engine component describing electromagnetic characteristics of the aircraft engine component (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg. 534, abstract); means for transforming the finite element model into a plurality of independent modes (Barka: pg. 2566, lines 11-18); means for determining, for each independent mode of the plurality of independent modes, a portion of an electromagnetic near-field contributed by each independent mode (Barka: pg. 2566, lines 11-18 and pg. 2567, lines 21-22); and means for summing the portion of the electromagnetic near-field contributed by each independent mode of the plurality of independent modes to calculate a total electromagnetic near-field for the aircraft engine component (Barka: pg. 2566, lines 11-18); means for determining a total electromagnetic far-field for the aircraft engine component from the total electromagnetic near-field for the aircraft engine component (Barka: pg. 2566, lines 11-18); and means for determining the radar cross section for the aircraft engine component from the total electromagnetic far-field (Barka: pg. 2567, lines 18-34).

Claim 18. The system of claim 17 wherein: the aircraft engine component has an axi-periodic structure (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract); said means for creating a finite element model for the aircraft engine component (Barka: pg. 2566, lines 1-3 and 11): further comprises: means for creating a finite element model of a preselected period of the axi-periodic structure of the aircraft engine component; and said means for transforming the finite element model into a plurality of independent modes further comprises: means for assembling a system matrix for the finite element model of the preselected period of the axi-periodic structure of the aircraft engine (Barka: pg. 2566, Introduction; and D'Angelo: abstract) component; and means for applying a Discrete Fourier Transform to the system matrix (D'Angelo: pg.537, equation 20).

Claim 19. The system of claim 1, (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg.534, abstract) wherein said means for determining, for each independent mode of the plurality of independent modes, a portion of an electromagnetic near-field (D'Angelo: equation 13 with section III Radar Cross Section Calculation) contributed by each independent mode comprises: means for creating an impedance matrix for a test fixture (Barka: pg. 2567, lines 1-3 and D'Angelo: pg. 540, lines 14-31); means for creating an impedance matrix for the aircraft engine component in a cavity (Barka: pg. 2567, lines 1-3 and D'Angelo: pg. 540, lines 14-31); means for creating an impedance matrix for a reference pipe having an infinite length (Barka: pg. 2567, lines 1-3 and D'Angelo: pg. 540, lines 14-31); means for coupling the impedance matrix for the test fixture to the impedance matrix for the aircraft engine component to create an impedance matrix for

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the combination of the test fixture and the aircraft engine component (Barka: pg. 2567, lines 1-3 and D'Angelo: pg. 540, lines 14-31); means for coupling the impedance matrix for the reference pipe to the impedance matrix for the combination of the test fixture and the aircraft component to create an impedance matrix for the reference pipe, the test fixture and the aircraft engine component having a common interface between the test fixture and the reference pipe (Barka: pg. 2567, lines 1-3 and D'Angelo: pg. 540, lines 14-31); and means for solving the impedance matrix for the reference pipe, the test fixture and the aircraft engine component by introducing a mathematical representation of an incident wave at the common interface of the test fixture and the reference pipe (Barka: pg. 2567, lines 1-3 and D'Angelo: pg. 540, lines 14-31).

Claim 20. The system of claim 17 (Barka: pg. 2566, lines 1-3 and 11; D'Angelo: pg. 534, abstract) wherein said means for determining, for each independent mode of the plurality of independent modes, a portion of an electromagnetic near-field contributed by each independent mode further comprises: means for coupling the impedance matrix for the reference pipe to another identical impedance matrix for the reference pipe to create an impedance matrix for a two-sided reference pipe having a common interface (D'Angelo: pg. 540, lines 14-24); means for solving the impedance matrix (D'Angelo: pg. 540, line 1-8) for the two-sided reference pipe by introducing the incident wave at the common interface of the two reference pipes (Barka: pg. 2566, lines 20-24); and means for determining the difference between the solution of the impedance matrix for the reference pipe, test fixture and aircraft engine component and the solution of the

impedance matrix for the two-sided reference pipe (D'Angelo: pg.536, equation 13 with pg. 536, lines 1-4 and figures 1 and 2 and pg. 540, lines 1-8).

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Tom Stevens whose telephone number is 571-272-3715, Monday-Friday (8:00 am- 4:30 pm) or contact Supervisor Mr. Kevin Teska at (571) 272-3716. Fax number is 571-273-3715.

Any inquires of general nature or relating to the status of this application should be directed to the Group receptionist whose phone number is (571) 272-1400

March 2, 2005

THS


SAMUEL BRODA, ESQ.
PRIMARY EXAMINER